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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,086	12/11/2003	Zbysław R. Owczarczyk	86429AEK	8484

7590 06/14/2004

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EXAMINER

VOLLANO, JEAN F

ART UNIT	PAPER NUMBER
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1621

DATE MAILED: 06/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/733,086	<b>Applicant(s)</b> OWCZARCZYK, ZBYSLAW R.	
	<b>Examiner</b> Jean F. Vollano	<b>Art Unit</b> 1621	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/11/03</u> . | 6) <input type="checkbox"/> Other: ____.  |

### DETAILED ACTION

1. The pending application has no priority claims. The application has claims 1-21 pending.

#### *Claim Rejections - 35 USC § 112*

2. Claims 1-21 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a compound of formula 1 to be the starting material which produces a compound of a deprotonated compound of formula 1 (wherein 1-4 are carbons) with an insertion of a BF<sub>2</sub> moiety attached to the pyridine nitrogens as the product ( formula 2 in the specification wherein 1-4 are carbons) in a solvent of formula 3 , does not reasonably provide enablement for any bis(azinyl) amine being reacted in any polar aprotic solvent . The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to prepare the invention commensurate in scope with these claims.

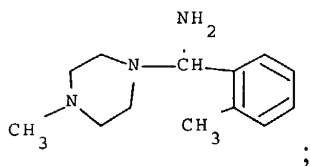
The claims are drawn to “a process for preparing”. The claim language in independent claim 1 has any deprotonated bis (azinyl) amine as a starting material. There is no designation of what exactly is meant by a bis azinyl amine. When this was searched on line in the chemical abstracts registry file there were 0 hits. This term is not a term that is commonly used in the chemical literature which in itself makes the starting material confusing as to what applicant is trying to use in the instant process. When the term azinyl was searched in the registry file of chemical abstracts the following was obtained:

=> s azinyl

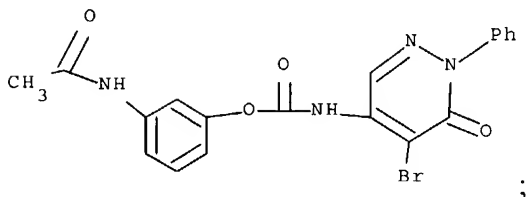
L1        6 AZINYL

Art Unit: 1621

There were only 6 compounds that had the word azinyl in them. Five of which were not polymers. The five contained 1) pentaoxazinyl which is a ring with 5 oxygens and one nitrogen; 2) 2-Methyl-.alpha.-(4-methyl-1-piprazinyl)benzylamine which has a piperazine ring but not a pyridine ring and which is an amine compound as shown below-



3) m-(Acetamido)phenyl (1-phenyl-5-bromo-6-oxo-4(1H)-pyridazinyl)carbamate which has an amine and a pyridazinyl moiety of



4) 2-(4-Methylpiperazinyl)-10-methyl-3,4-diazaphenoxazine

dihydrochloride ( which again is a piperazine ring); and 5) 10H-Phenothiazine, 10-[3-(4-methyl-1-piperazinyl)propyl]-2- (trifluoromethyl)-, dihydrochloride (which again contains a piperazine). The generic compound of formula 1 in claim 15 is not found with the name azinyl in it. The compounds searched with this generic structure are called pyridinyl. There are also phenanthridinaminato as well as others but no generic azinyl. Also the deprotonated bis (azinyl) amine term is confusing as to whether the the bis azinyl is deprotonated ( i.e. pyridinium deprotonated to pyridine) or the amine is deprotonated assuming there is a proton because that is not required. The complexity of the terminology is such that a large number of compounds can

Art Unit: 1621

be envisioned as being a bis(azinyl) amine which is deprotonated anywhere. The product would also be dependent on the starting material and there is no teaching of what the general terms of the compounds are referring to. Also the specification only gives results with a pyridine ring or fused carbon rings that are based on one heterocycle being a pyridine in any fused ring system and no other heterocyclic rings are mentioned. There is no guidance of how to prepare a compound for example wherein 1 and 1' nitrogen. This would have a different electronic effect and the complex of the compound with BF<sub>3</sub> may have other positions which it would interact. There is no guidance in any scenario of how to use the instant invention except when the rings are pyridine or pyridine based. The examiner cannot find any compounds that have the BF<sub>2</sub> complex wherein there are nitrogens in any of the 1-4 and 1'-4' positions. These compounds do not appear to exist so then there is no guidance on how to prepare these compounds in the prior art and applicant has given no guidance on how to prepare the compounds being claimed wherein R1-R4 is not carbon. The only guidance in the specification is drawn to making a compound of formula using a compound of formula 1 wherein 1-4 and 1'-4' are carbon in a solvent of formula 3.

This brings up the solvent. In claim 1 the solvent is classified as a polar aprotic solvent. However there is no discussion or teaching of what polar aprotic solvents are usable except for a compound of formula 3. In the specification on page 11 there is a table of various solvents for the reaction. One solvent is THF which can be classified as a polar aprotic solvent. However according to the specification it is not a solvent that is effective in preparing the compounds being claimed. Also there is a slight dipole in toluene which could classify it as a slightly polar solvent and it is aprotic. However, again, according to the table it is not a good solvent for the

Art Unit: 1621

process. DMSO and other solvents are mentioned which could be classified under the broadest terms as polar aprotic solvents which again are not usable. It seems that applicant's table is stating that compounds of formula 3 which are substituted or non substituted alkylcyano compounds (e.g. acetonitrile) are the compounds which are the only polar aprotic solvents that work in the process.

The process being claimed in the independent claims as far as what is being reacted, what is being prepared and what is used as a solvent is so general that one would have to take all the individual starting materials and react them in various polar aprotic solvents with  $\text{BF}_3$  to find out if they would or they would not form the complex. This would take undue experimentation to find out what the scenarios would be applicable for each process to be successful in producing a  $\text{BF}_2$  complex.

It is also noted that the formation of the  $\text{BF}_2$  complex has of bis azinyl compounds uses polar aprotic solvents as found in US 5,274,113 but these are ones that applicant teaches in the specification are not usable in the instant process. So there is little help from the art without undue experimentation to make the process being claimed to the scope it is claimed.

It is noted that the process being claimed in the instant invention must be in possession of the applicant at the time of filing and the metes and bounds clearly defined.

In the instant invention the scope of the claims is broader than the scope of the enablement and it would take undue experimentation to make and use the instant process to the scope being claimed.

Art Unit: 1621

3. Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation of a “deprotonated bis(azinyl) amine compound”. It is unclear what the metes and bounds are of this limitation. The examiner searched bis azinyl amine in the chemical abstracts on line section and found 0 hits there were some azinyl compounds but no bis azinyl compounds. Nor is it clear what is deprotonated Is it the azinyl portion or the amine portion. ( It is noted that the amine portion does not require a primary or secondary amine. Also it is unclear where the BF<sub>2</sub> complex is formed with the bis azinyl amine . Is it attached to the amine and one azinyl moiety? Or is it attached to any azinyl moiety? Also the complex does not say deprotonated so is the amine or azinyl moiety protonated after the reaction? The wording for the compounds being prepared and being used as starting materials as vague and indefinite as to the metes and bounds of what is being claimed as the instant invention. The same problem exists in claim 11.

Claim 3 , it appears, has a typographical error. Should “cycloalyl” be cycloalkyl. If not what is cycloalyl?

Claim 9 and claim 10 recite “BF<sub>3</sub> source comprises”. This is confusing as to what else is found in the term comprises. In the specification it does not appear that the BF<sub>3</sub> source contains anything other than the BF<sub>3</sub> as gas, as a solution in an organic solvent or as a complex with an organic solvent or compound. Shouldn't the claim be - - wherein the BF<sub>3</sub> source is selected from the group consisting of BF<sub>3</sub> gas, etc - -. This is a process and the reagents are critical elements in that process if the process comprises other elements in the source then they may be

Art Unit: 1621

critical to the reaction . Also the examiner cannot find any mention in the specification of the addition material which fits under the umbrella of the term “comprises”.

Claim 11 recites the limitation of “protonated bis(aziny) amine compound”. This term lacks antecedent basis. There is a ratio that is being defined in comparison to this group. However this group is found no where in the preceding claims and therefore the ratio is confusing as to what is being claimed.

Claim 15 recites the limitation of a ring with 1, 2, 3 and 4 in the ring and the claim states that 1, 2, 3 and 4 are nitrogen or carbon. If 1-4 are carbon there is an aromatic pyridine ring. If they are other nitrogen groups and there can be a Xa or Xb on the ring then it is unclear what is the other counter ion since if Xa is attached to a nitrogen that is double bonded then the group would be a +1 charge since nitrogen has only 3 bonds in a neutral state? The claim is confusing as to the metes and bounds being claimed.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, and 9-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Sathyamoorthi ( Heteroatom Chemistry 1993) in view of Chem abs 351 (CA:50:22351).



Art Unit: 1621

Sathyamoorthi teaches the process for making azavinamidine-BF<sub>2</sub> complexes including a tetraphenyl 8-azapyrromethene(see abstract on page 603 and page 607 compound 17) which uses 5equivalents per mole of the azapyrromethene(see page 607prep for compound 17).

When Sathyamoorthi teaches that the process includes a reaction in a base which is polar, a boron etherate ( which when dissolved would add to a polar solvent ) and toluene which has a small dipole moment at taught in Chem abs 351 ( and void of a specific definition of the metes and bounds of the term polar in the specification any material with a dipole moment can be considered very slightly polar). The combination of the three polar or two polar and one very slightly polar moieties would indeed lead to a polar solvent. When the reaction of the BF<sub>3</sub> etherate with the tetraphenylpyrroazamethene is performed at 80<sup>0</sup>C then the claims are fully anticipated.

It is noted by the examiner that the specification seems in the table and the page after (pg12) the table to exclude DMSO, THF , dichloroethane and DMF as polar solvents and it is unclear from the specification what the metes and bounds are of the term aprotic polar solvents. There for any compound which has a dipole moment would be somewhat even though very slightly polar and can be used in the context of the instant invention since the broadest definition can apply. It is also noted that Chem abs 351 was used solely to support and point out the fact that the toluene has a slight dipole moment which would make it polar in the broadest sense of the word.

5. Claims 1, and 9-10 and 11-21 are rejected under 35 U.S.C. 102(e) or alternatively under 35 U.S.C. 102(a) as being anticipated by Hong et al (US 6,661,023) in view of Chem abs 351 (CA:50:22351).

Art Unit: 1621

Hong teaches a process for the preparation of preparing a BF<sub>3</sub> complex of a deprotonated compound of instant formula 1 by reacting a compound of instant formula 1 with BF<sub>3</sub> etherate( i.e. BF<sub>3</sub> OEt) in the presence of a polar base (amine in example 1) and in a slightly polar solvent which is toluene as taught by Chem abs 351. ( see column 25 example 1 and 2) at the boiling point of the solution (i.e. reflux) which would be essentially the temperature of the toluene's boiling point which is around 111<sup>0</sup>C at STP.

When Hong exemplifies the compounds and the generic structure of formula 1 then the claims are fully anticipated( see columns 3-10).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sathyamoorthi ( Heteroatom Chemistry 1993) in view of Chem abs 351 (CA:50:22351) .

The rejection is essential the same as supra.

The process of Sathyamoorthi differs in that the reaction temperature is 80<sup>0</sup>C and not at least 115<sup>0</sup>C.

It would have been well within the purview of one of ordinary skill in the art to have prepared the compound by the known process of Sathyamoorthi and to have optimized the

Art Unit: 1621

temperature to optimize the yield or the reaction time. It is not an unobvious modification to optimize reaction conditions of a known process. In re Aller 105 USPQ 233 (CCPA) 1955 “Normally, change in temperature, concentration, or both, is not patentable modification...”

6. Claims 1, 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hong et al (US 6,661,023) in view of Chem abs 351 (CA:50:22351).

The rejection is essential the same as supra.

The process of Hong differs in that the reaction temperature is about 111<sup>0</sup> C and not at least 115<sup>0</sup>C also the number of equivalents of the BF<sub>3</sub> etherate to the moles of bis azinyl compound is not given. (It is noted that the stoichiometric amount is 1:1 and this would have been obvious to one of ordinary skill in the art to have at least used the stoichiometric

It would have been well within the purview of one of ordinary skill in the art to have prepared the compound by the known process of Hong and to have optimized the temperature and the molar ratio to optimize the yield and/or the reaction time. It is not an unobvious modification to optimize reaction conditions of a known process. In re Aller 105 USPQ 233 (CCPA) 1955 “Normally, change in temperature, concentration, or both, is not patentable modification...”

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 1621

The prior art ( US 5,446,157 , US 5,451,663 , US 5,274,113, US 5,852,191, CA:134:115652, CA:134:115652) teaches processes and polar compounds similar to those of the instant invention.

US 5,446,157 teaches boron difluoride compounds of 5 membered bis pyrrole type compounds that are prepared by using a base and a BF<sub>3</sub> etherate in benzene.

US 5,451,663 and US 5,274,113 teach boron difluoride compounds of 5 membered bis pyrrole ring systems using using a base and in the presence of dichloromethane.

US 5,852,191 teaches pyridine based monomethine boron complexes but not amine analogues.

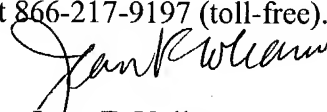
CA:134:115652 teaches that dichloromethane is a polar solvent and CA:69:51970 teaches that dichloromethane and dichloroethane as polar solvents.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean F. Vollano whose telephone number is 571-2720648. The examiner can normally be reached on Monday-Thursday 6:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on 571-272- 0646. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1621

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jean F. Vollano  
Primary Examiner  
Art Unit 1621

June 4,2004